Chapter 4. Part 3. Burns and Scalds

Chapter 4 • Management of Common Injuries

Part 3 • Burns and Scalds

(How to recognise the type and depth of a burn—and what to do in the first 10 minutes)

1 What Are Burns and Scalds?

- Burn = tissue damage caused by dry heat (flame, hot metal, electricity, chemicals, radiation).
- Scald = burn caused by moist heat (boiling water, steam, hot oil, soup).
 Both destroy skin cells and, if deep, the tissues underneath (fat, muscle, even bone).

2 Classification by Depth (How Many Skin Layers Are Injured?)

Old Term	Modern Term	Skin Layers Involved	Key Visual Signs	Pain Level	Healing Time*
1st-degree	Superficial burn	Only epidermis	Red, dry, no blisters (like sunburn)	Painful	3-7 days, no scar
2nd-degree	Superficial partial- thickness	Epidermis + top dermis	Red-pink, clear blisters , moist, capillary refill brisk	Very painful	1-3 weeks, minimal scar
	Deep partial-thickness	Epidermis + deep dermis	Blotchy red-white, sluggish cap refill, less moist	Sensation ↓	3-6 weeks, often scars
3rd-degree	Full-thickness	All skin layers, may expose fat	Waxy white, brown or charred; painless (nerves burned)	No pain in centre	Needs grafting
4th-degree	Sub-dermal	Skin + fat + muscle / bone	Charred, black, bone visible	No pain in centre	Surgical / amputation
*Assuming go	od first aid and no infection	,			

^{*}Assuming good first aid and no infection.

3 Classification by Size (Total Body Surface Area = TBSA)

Use the **Rule of Nines** for adults:

• Head = 9% • Each arm = 9% • Each leg = 18% • Torso front = 18% • Back = 18% • Perineum = 1%

Severity Guide (Adults)

Burn Depth	TBSA %	Classified As	Action
Any superficial	<10 %	Minor	Out-patient care
Partial-thickness	10-20 %	Moderate	Hospital observation
Full-thickness	>1 % OR any on face, hands, feet, genitalia, joints	Major	Burn centre / ICU

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WHERE CLASSICAL WISDOM MEETS INTELLIGENT LEARNING

4 First-Aid Principles—The "C O O L" Rule

Cool • Observe • Over (cover) • Loop in help

- 1. Cool the burn with running cool tap water (NOT ice, NOT icy water) for 20 minutes. Works up to 3 h after
- 2. **Observe** for jewellery, tight clothing—remove gently before swelling starts.
- 3. Cover the area with a clean non-fluffy dressing: cling film, sterile gauze, or a clean plastic bag (for hand/foot).
- 4. Loop in help: call EMS if burn is deep, >10 % TBSA, electrical, chemical, on critical areas, or if the casualty is a child/ elderly.

Special First Aid by Cause

5.1 Thermal Burns (Flame, Hot Objects, Scalds)

- 1. Stop the heat source—turn off gas, smother flames with blanket.
- 2. Follow C O O L.
- 3. **Do NOT**: apply butter, toothpaste, turmeric, or ice; break blisters.

5.2 Chemical Burns (Acids, Alkalis, Industrial Cleaners)

- 1. Protect yourself—wear gloves, goggles.
- Brush off dry powder chemicals first (lime, cement).
- 3. Irrigate immediately with copious running water for 30 minutes or until EMS says stop. Remove contaminated clothing while flushing.
- Cover loosely with sterile dressing.
- 5. Do NOT neutralise with the opposite chemical (acid vs base)—can cause heat reaction.

5.3 Electrical Burns (Household, Power Lines, Lightning)

- 1. **Switch off power** or push casualty away with non-conductive stick.
- 2. **Check ABCs**—cardiac arrest common; start CPR if no pulse.
- 3. Look for entry and exit wounds (small skin burns) but assume deep tissue damage.
- 4. Treat any visible burns as thermal (C O O L) but always send to hospital (risk of heart rhythm trouble, kidney injury).
- 5. If lightning strike: Treat as electrical; multiple casualties—first treat those who appear dead (they may be in reversible cardiac arrest).

Immobilisation & Transport

Situation Simple Immobilisation Trick

Burn on limb with severe pain/swelling Elevate on pillow; loosely wrap with cling film from distal \rightarrow proximal to limit oedema.

Sit upright if conscious; watch for hoarse voice / stridor—prepare for rapid EMS Facial burn with airway risk

arrival.

Circumferential limb burn Remove rings/watches; mark pulses; splint gently to reduce movement pain.

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7 Red-Flag Signs—Call EMS or Go to Burn Centre

- Burned area larger than the patient's palm × 3.
- Full-thickness or deep partial-thickness burn anywhere.
- Any burn on face, hands, feet, groin, major joint.
- Chemical or electrical source.
- Signs of inhalation injury (soot in mouth, coughing black, singed nasal hair, hoarse voice).
- Child <5 y or adult >60 y with >5 % TBSA burn.
- Casualty with diabetes, heart disease, or immune compromise.

8 Self-Check Quiz

- 1. Why is ice a bad idea on a fresh burn?
- 2. How long should you flush an alkali chemical burn to the eye?
- 3. Which two hidden complications worry us most after an electrical burn?
- 4. What depth of burn is painless in the centre and why?
- 5. **Rule of Nines**: What percent is the front of one leg?
- 1. Causes vasoconstriction → worsens tissue death; may create frost injury.
- 2. Minimum 20-30 min with cool water or sterile saline.
- 3. Cardiac arrhythmia and muscle-breakdown kidney damage (rhabdomyolysis).
- 4. Full-thickness burn; nerves destroyed.
- 5. 9 % (each leg front = half of 18 %).

Key Take-Home Points

- **Depth + Size = Severity.** Learn the table.
- COOL water is your first medicine—20 min for thermal, 30 min+ for chemical.
- Never add exotic substances; clean, cover, and refer.
- Electrical burns look small outside but cook deep inside—always hospital.
- Protect yourself first; a burned first aider helps no one.

Next skills lab: Practise building a burn dressing using cling film and learn to pour "continuous cool water" on a mannequin limb while keeping the rest of the body warm with blankets.

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